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BASAL WOUNDING TO IMPROVE ROOTING AND ROOT GROWTH OF TEA (*CAMELLIA* L. SPP.) CUTTINGS

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VARIOUS methods, such as basal wounding, grafting and pretreatment of the propagation material with mineral nutrients, root promoting hormones, and vitamins have been in use to enhance the success of vegetative propagation of shy rooting cultivars of several orchard and plantation crops[1]. Since basal wounding of the propagation material is relatively inexpensive and has been found to improve the rooting of cuttings of apple, apricot, olive and plum[2-5], its usefulness in the rooting of tea cuttings was investigated.

The experiment was carried out using single leaf and internode cuttings of a difficult-to-root clone, UPASI-8, and an easy-to-root clone, UPASI-10, and the effect of the following treatments was investigated: (i) one split of the basal part of the internodes to a length of 1 cm at the centre of the bottom cut end; (ii) two splits of the basal part of the internodes, each split being at right angles to the other; and (iii) unwounded, control. The basal part of the internodes of cuttings was split using a sharp razor blade. The experiment was of a randomised block design, with five replications per treatment and 50 cuttings in each replication. The cuttings under the different treatments were kept for rooting on 10 October 1980 and were raised according to standard nursery practices[6].

Observations on the percentage of rooted cuttings under different treatments were recorded at the end of 12 weeks from striking, by examining 10 cuttings at random in each replicate. Additionally, the number of roots in each rooted cutting, length of roots, length of the axillary shoot, and the dry weights of root and shoot systems were recorded in five cuttings, selected at random, in each replicate.

The results indicated that in the case of the difficult-to-root clone, UPASI-8, the percentage of rooted cuttings was significantly higher under both the treatments of basal wounding, when compared with that of the unwounded, control (table 1); however, the difference between the two treatments of basal wounding was not significant. In the case of the easy-to-root clone, UPASI-10, differences in the percentage of rooted cuttings were not significant between either of the treatments of basal wounding and unwounded, control (table 1).

The number of roots per cutting, length of roots, length of the axillary shoot and the dry weights of root

TABLE 1

Effect of basal wounding on rooting and root growth of UPASI-8 and UPASI-10 cuttings

Rooting and growth parameters \ Treatments	Unwounded, Control		One split at basal cut end		Two splits at basal cut end		C.D. at $P=0{\cdot}01$	
	UPASI-8	UPASI-10	UPASI-8	UPASI-10	UPASI-8	UPASI-10	UPASI-8	UPASI-10
% of rooted cuttings	40	78	76	80	78	79	34	N.S.
Mean number of roots per cutting	4	7	11	14	12	15	6	6
Mean length of each root per cutting (cm)	4·4	4·2	9·0	8·0	8·8	9·2	3·8	2·2
Mean length of shoot per cutting (cm)	4·8	5·0	9·2	8·6	9·8	7·4	3·0	2·2
Mean dry weight of the root system per cutting (mg)	31	50	54	76	63	79	21	18
Mean dry weight of the shoot system per cutting (mg)	28	49	44	82	41	84	4	25

N.S. = Not significant.

and shoot systems, were significantly higher under the two treatments of basal wounding, in both the clones, when compared with unwounded, control (table 1; figure 1). Again, differences between the two treatments of basal wounding were not significant.

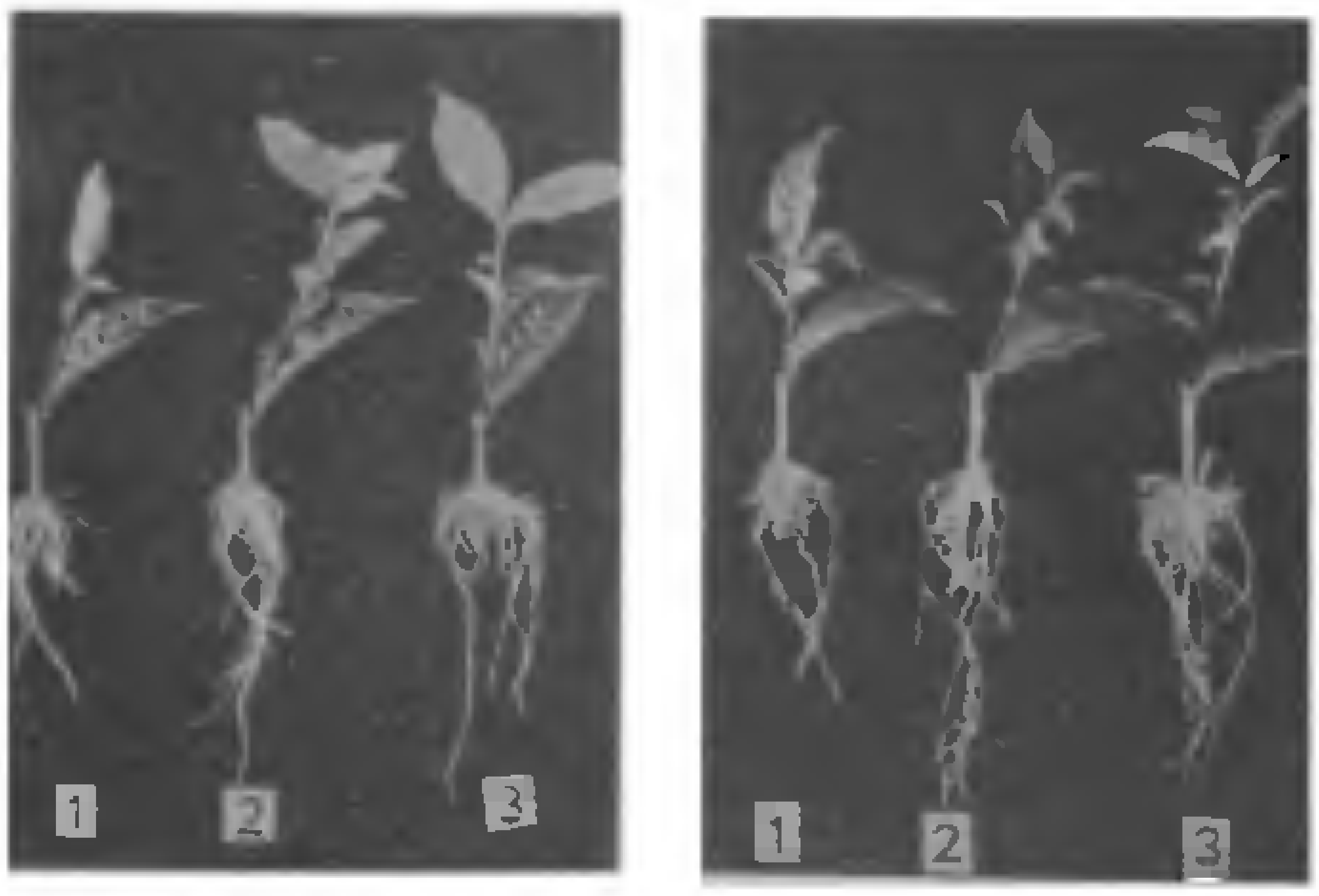

Figure 1. UPASI-8 (left) and UPASI-10 (right) cuttings. **1** and **4.** Unwounded, control, **2** and **5** One split treatment; **3** and **6** Two splits treatment. Photographs taken 20 weeks after striking in nursery sleeves.

Anatomical structures were directly correlated with rooting potential in a number of plant species[7,8]. Sclerenchyma in stems of easy-to-root species was found to be either in an interrupted ring around vasculature or in a few layers to allow the vascular rays to open freely in the cortex. In difficult-to-root species, one or more layers of sclerenchyma were found to surround the vascular tissue in a ring and often they were further strengthened by ring(s) of collenchymatous hypodermis. The fibrous and hypodermal ring(s) act as mechanical barriers to the protrusion of root initials[9,10]. Basal wounding of cuttings was reported to improve the rooting of difficult-to-root cultivars[1-5]; this may be due to the fact that the root initials originating from the medullary rays need not have to traverse through the sclerenchymatous sheath along the split surface and could directly emerge.

It is, thus, evident that basal wounding of the cuttings of the difficult-to-root clone, UPASI-8, apart from enhancing the percentage of rooting, also resulted in vigorous plants, as substantiated by the data recorded on various growth parameters (table 1; figure 1). In the case of the easy-to-root clone, UPASI-10, although the percentage of rooted cuttings was not influenced by either of the treatments of basal wounding, the beneficial effect on the vigour of the plants, as expressed by the improved growth of roots and shoots, is discernible (table 1; figure 1). Since differences between the two treatments of basal wounding were not significant, it is suggested that one split of 1 cm length be made at the centre of the bottom cut end of tea cuttings.

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SCANNING ELECTRON MICROSCOPIC ANALYSIS OF POLLEN IN *BIOPHYTUM INTERMEDIUM* WIGHT (OXALIDACEAE)

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THE term tristyly refers to a type of floral polymorphism in which three kinds of plants are represented in a species, characterised by flowers with a long style and stamens at two levels below the stigma; with mid style flower and one set of stamens above and the other set below the stigma and flower with short style and stamens at two levels above the stigma. The three flower forms are referred to as long, mid and short styled and occur in approximately equal proportions in natural population of a species. Darwin[1] studied tristyly in considerable detail in *Lythrum salicaria* (Lythraceae); *Oxalis* species (Oxalidaceae) and *Pontederia* (Pontederiaceae). Several species of *Biophytum* have been investigated